

### **REMARKS**

Claims 2-7, 9-12, 14-28, 30-34, 36-39, 44-46, 51 and 53-61 are now pending in the application. Of these, claims 2-7, 9-12, 14-28, 30-34, 36-38, 51, and 53-61 are withdrawn. Applicant amends claims 39 and 46 herein and claims 1, 8, 13, 29, and 35 are cancelled. Support for the amendments can be found throughout the specification, claims and drawings as originally filed. For example, please see Figs. 34, 35 and 37. Accordingly, no new matter is added. Applicant respectfully requests reconsideration and withdrawal of the rejections in view of the amendments and remarks contained herein.

### **REJECTION UNDER 35 U.S.C. § 102**

Claims 39, 44 and 45 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Colley et al. (U.S. Pat. No. 6,547,145). This rejection is respectfully traversed. Notwithstanding Applicant's traverse and solely in the interest of expediting prosecution, Applicant amends claim 39.

Amended claim 39 recites a drive mechanism of a micro mirror in a digital micro mirror device, comprising: a micro mirror support mechanism; and a drive circuit for supplying a drive signal to said support mechanism; wherein said support mechanism comprises a set formed from a plurality of magnetic bodies, said drive circuit supplies a frequency drive signal to at least one of said magnetic bodies, and said support mechanism inclines said micro mirror by making the magnetic fields from said magnetic bodies interfere with each other, wherein said drive circuit comprises Pulse Width Modulation control means for executing, under the Pulse Width Modulation control, the

supply of said frequency drive signal to said magnetic bodies, wherein said set of magnetic bodies is formed from a permanent magnet bar and a coil, wherein one end of said permanent magnet bar supports the center of the back of said micro mirror, said coil is disposed so as to face the other end of said permanent magnet bar, and said drive circuit supplies said frequency drive signal to said coil, wherein a supporting axis of said micro mirror is structured with said permanent magnet bar, wherein a fulcrum of said micro mirror is provided on said permanent magnet bar, and said permanent magnet bar inclines around said fulcrum, and wherein a first incline of said micro mirror is provided by said frequency drive signal with first polarity and first duty ratio of said Pulse Width Modulation control, a second incline of said micro mirror is provided by the drive signal with first or second polarity and second duty ratio of said Pulse Width Modulation control.

For anticipation to be present under 35 U.S.C §102(b), there must be no difference between the claimed invention and the reference disclosure as viewed by one skilled in the field of the invention. Scripps Clinic & Res. Found. V. Genentech, Inc., 18 USPQ.2d 1001 (Fed. Cir. 1991). All of the limitations of the claim must be inherent or expressly disclosed and must be arranged as in the claim. Constant v. Advanced Micro-Devices, Inc., 7 USPQ.2d 1057 (Fed. Cir. 1988). Here, Colley fails to disclose the limitations of: (1) "one end of said permanent magnet bar supporting the center of the back of said micro mirror, said coil being disposed so as to face the other end of said permanent magnet bar, and said drive circuit supplying said frequency drive signal to said coil"; (2) "a fulcrum of said micro mirror being provided on said permanent magnet bar, and said permanent magnet bar inclining around said fulcrum"; and (3) "a

first incline of said micro mirror being provided by said drive signal with first polarity and first duty ratio of said Pulse Width Modulation control, a second incline of said micro mirror being provided by the drive signal with first or second polarity and second duty ratio of said Pulse Width Modulation control”.

More particularly, the claimed invention provides a digital micro-mirror device which chooses either one of an off (first)-state or on (second)-state of a pixel, by supplying the frequency drive signal to the coil. The first state of the pixel, which corresponds to the first incline of the micro mirror, is set by the frequency drive signal with the first polarity and the first duty ratio. The second state of the pixel, which corresponds to the second incline of the micro mirror, is set by the frequency drive signal with the first or the second polarity and the second duty ratio.

Colley fails to disclose the claimed invention. First, Colley fails to disclose the claimed drive mechanism of the micro-mirror. Instead, Colley teaches a mirror 102 mounted at one end of a bending member 112 that also supports a mount member 114 at the opposite end thereof. A drive coil 106 or feedback coil 108 is separated from the bending member 112. The bending member 112 can never be a magnet or a member providing a magnetic field. In contrast, in the claimed invention, the one end of the permanent magnet bar supports the center of the micro mirror and the coil is disposed at the other end of the permanent magnet so as to face the other end of the permanent magnet bar. Colley does not teach or suggest this feature.

In addition, Colley fails to disclose a drive signal with a specific polarity and duty ratio for controlling an incline of the micro-mirror. Instead, Colley teaches an oscillating drive current provided to the drive coil 106 but, as shown in Fig. 2, the incline of the

mirror 102 is not controlled by changing both the polarity and the duty ratio. For example, in Fig. 5, the drive current for the drive coil 106 has a pulse signal with a fixed duty and a single polarity. With this configuration of the drive current, the device disclosed in Colley cannot keep the mirror 102 in a specific position (for example, an on/off position of the mirror).

Inasmuch as Colley fails to teach or suggest all of the claim limitations, Colley cannot anticipate claim 39. Therefore, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claims 44 and 45 depend from claim 39 and should be in condition for allowance for at least the same reasons as set forth above.

#### **REJECTION UNDER 35 U.S.C. § 103**

Claim 46 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Colley et al. (U.S. Pat. No. 6,547,145) in view of Kane et al. (U.S. Pat. No. 6,753,931). This rejection is respectfully traversed. Notwithstanding Applicant's traverse and solely in the interest of expediting prosecution, Applicant amends claim 46.

Amended claim 46 recites a drive mechanism, comprising: a set comprising a plurality of magnetic bodies; a drive circuit for supplying a frequency drive signal to said set; and means for producing movement caused by the attraction/repulsion between said magnetic bodies; wherein said movement is the driving source of said drive mechanism, wherein red (R), blue (B) and green (G) reflection areas are formed on a micro mirror, said drive circuit supplies said frequency drive signal to said magnetic body for each R, B and G, and, in correspondence to said frequency drive signal, and

the reflective surface of the corresponding colors of said micro mirror inclines toward the reflecting direction, wherein said set of magnetic bodies is formed from a permanent magnet bar and a coil, wherein one end of said permanent magnet bar supports the center of the back of said micro mirror, said coil is disposed so as to face the other end of said permanent magnet bar, and said drive circuit supplies said frequency drive signal to said coil, wherein a supporting axis of said micro mirror is structured with said permanent magnet bar, wherein a fulcrum of said micro mirror is provided on said permanent magnet bar, and said permanent magnet bar inclines around said fulcrum, wherein said drive circuit comprises Pulse Width Modulation control means for executing, under the Pulse Width Modulation control, and supply of said frequency drive signal to said coil, and whereby a first, a second, and a third inclines of said micro mirror are provided by said frequency drive signal with polarities and duty ratio of said Pulse Width Modulation control corresponding to the R, G, and B reflective areas of said micro mirror.

It is a longstanding rule that to establish a prima facie case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. Furthermore, when evaluating claims for obviousness under 35 U.S.C. §103, all of the limitations must be considered and given weight. Ex parte Grasselli, 231 USPQ 393 (Bd. App. 1983), MPEP § 2144.03. Here, the alleged combination of Colley and Kane et al. fails to disclose: (1) "one end of said permanent magnet bar supporting the center of the back of said micro mirror, said coil being disposed so as to face the other end of said permanent magnet bar, and said drive circuit supplying said frequency drive signal to said coil"; (2) "a fulcrum of said micro mirror being provided on said permanent

magnet bar, thereby said permanent magnet bar inclining around said fulcrum”; and (3) “a first incline of said micro mirror being provided by said drive signal with first polarity and first duty ratio of said Pulse Width Modulation control, a second incline of said micro mirror being provided by the drive signal with first or second polarity and second duty ratio of said Pulse Width Modulation control”.

As stated above, the claimed invention provides a digital micro-mirror device which chooses either one of an off (first)-state or on (second)-state of a pixel, by supplying the frequency drive signal to the coil. The first state of the pixel is set by the frequency drive signal with the first polarity and the first duty ratio. The second state of the pixel is set by the frequency drive signal with the first or the second polarity and the second duty ratio. In addition to the features discussed above with respect to claim 39, in the color digital micro-mirror device of amended claim 46, the polarity and the duty ratio of the frequency drive signal corresponds to the R, G, and B reflective areas of the micro-mirror. (see Embodiment 14 in the specification and Figs. 34, 35, and 37).

Even if Colley is combined with Kane, the combination thereof fails to disclose the claimed invention. First, neither Colley nor Kane discloses the drive mechanism of the micro-mirror wherein the one end of the permanent magnet bar supports the center of the micro mirror, and the coil is disposed at the other end of the permanent magnet so as to face the other end of the permanent magnet bar. Colley is discussed above. Kane also fails to disclose this feature.

In addition, neither Colley nor Kane discloses controlling an incline of the micro-mirror by providing a drive signal with a specific polarity and duty ratio. Again, Colley is

discussed above. Kane is also silent with respect to this feature of the present invention.

Inasmuch as Colley and Kane both fail to teach or suggest the above claim limitations, the combination thereof cannot render claim 46 unpatentable. Therefore, Applicant respectfully requests reconsideration and withdrawal of this rejection.

### **CONCLUSION**

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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